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Nurses' attitudes toward computerisation

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NURSES' ATTITUDES TOWARD COMPUTERISATION

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USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

ABSTRACT

Currently bedside nurses working in Perth public hospitals have little exposure to electronic information systems (EIS's). Over the next two years an EIS will be implemented into the 15 Perth public hospitals by the Health Department of W. A. Acceptance of any EIS by staff determines whether such systems will be used. Therefore in order to gain maximum benefit from an EIS, it has been strongly suggested that hospitals examine the attitudes of their nurses toward computerisation. 130 nurses at a Perth teaching hospital responded to a questionnaire, incorporating a tool designed by Stronge and Brodt (1985), reported to be both reliable and valid, that measured their attitude toward computerisation. The study revealed that the overall attitude toward computerisation scored less when compared to other similar reported studies. As well, significant differences in attitude toward computerisation was found for specific variables, none of which had been reported in other studies. Recommendations concern trainers and EIS implementors being aware of and responding to the concerns and fears of the potential users.

DECLARATION

I certify that this thesis does not incorporate, without acknowledgment, any material previously submitted for a degree or diploma in any institution of higher education and that, to the best of my knowledge and belief, it does not contain any material previously published or written by another person except where due reference is made in the text.

Signed J. R. CROFTS

Dated 13.2.95

ACKNOWLEDGMENT

I would like to thank my supervisor Maxine Serrell for the guidance and support required to bring presentation of this thesis to fruition.

I would also like to thank the nurses at the study hospital for participating in the pilot and the main study.

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CHAPTER 1

Introduction

Computers have become an essential part of hospital environments. Essentially, computers store and manage information. Computers enable many traditional, laborious and mundane tasks to be automated, thus allowing staff to attend to their respective roles.

Background to the Study

Over the next two years, an electronic information system (EIS) will be introduced into fifteen Perth teaching and departmental hospitals. The system will contain the following modules: order entry, results review, care planning, discharge planning and charting, and will be used by all hospital staff who provide clinical care, including nurses. Computer terminals will be installed in patient care areas to provide access to the system.

It has been reported that a learner's attitude significantly determines how readily an individual learns (Hill, cited in Scarpa, Smeltzer, and Jasion, 1992, p. 72). This statement suggests that acceptance of EIS's can be influenced by attitude. Therefore in order to gain maximum benefit from unit based computers, it is recommended that hospitals examine the attitudes of their nurses toward computerisation (Gibson & Rose, 1986, p. 202).

Significance of the Study

Gibson and Rose (1986, p. 201) cite examples of computer resistance, and Barker and Scholes (cited in Stronge and Brodt, 1985, p. 154) report examples of failures of computer system implementation through neglect in identifying and addressing negative attitudes of hospital staff to computerisation.

The significance of this study involves the identification of neutral or negative attitudes of nurses' toward computerisation, so that training of these nurses can be designed to produce positive attitudes. If attitudes toward computerisation are positive, it is likely that the EIS will be accepted and used effectively.

Purpose of the Study

The purpose of the study was to determine if nurses' hold an overall positive, negative or neutral attitude toward computerisation and to identify variables which may significantly influence their attitudes toward computerisation.

Research questions:

The study asked the following questions:

1. What are the attitudes of nurses at a Perth teaching hospital toward computerisation?

2. Which variables, if any, influence nurses' attitude to computerisation?

3. How do nurses' expect computerisation to affect nursing care, job satisfaction, and working relationships with doctors, paramedical staff and patients?

Definition of Terms

Computer: a unit based terminal that allows access to information.

Terminal: is comprised of a monitor, keyboard and mouse, and allows for input, display and editing of data.

Electronic Information System: is a global hospital system that manages patient related information.

Computerisation: is the process of installing and using computers connected to an electronic information system.

Level one, Registered Nurse: is a registered nurse employed at entry level of the Western Australian Nurses Career Structure. Persons employed at this level have varying amounts of nursing experience and are entitled to apply for a position at the next level if one is available and they meet certain criteria.

Level two, Clinical Nurse: is a nurse registered with the Western Australian Nurses Board, who has three or more years experience and has gained the necessary clinical and leadership skills for the [promotional] position. Selection and appointment to this position is based on merit (Health Department of Western Australia, 1987).

Organisation of the Thesis

Chapter one discusses the background to the study, its significance and purpose. Definition of terms are stated, and the research questions are posed.

Chapter two describes reported studies which examine nurses' attitudes toward computerisation, and stresses the importance of identifying nurses' attitudes to computerisation prior to the implementation of an EIS.

Chapter three presents the theoretical framework for this thesis.

Chapter four explains the methodology for this study. The design of the study, sample and setting, variables, instrument, procedure and data analysis are detailed.

Chapter five presents the results of the study using tables and illustrations, and chapter six discusses the findings of the study.

Chapter seven discusses the conclusions that have been drawn from the study, the implications for nursing, and makes recommendations for nursing practice, management, education and future research. The study limitations are then noted.

CHAPTER 2

Literature review

The literature review discusses the literature related to the need for this study and findings of previous similar studies.

A search of the literature revealed an abundance of literature from North America related to computers and computerisation, but at the same time, it was found that there was a paucity of information specifically related to nurses' attitude toward computerisation. Literature relating to attitudes of other health professionals toward computerisation was also found to be scant. Interestingly, no published Australian studies could be found.

With the introduction of any EIS, new skills have to be learned. Hill (cited in Scarpa et al, 1992, p. 72) points out that "A learner's attitudes are of great significance in determining how readily that individual learns". In turn, what an individual learns can influence their attitude (Scarpa et al., 1992, p. 72). Ball, Snelbecker and Schecter (1985) earlier findings support these statements, they conducted a 2 hour computer literacy presentation to nurses, and reported on their ability to influence the participants attitude toward computers.

Gibson and Rose (1986) recommend as part of the transition to computer use, assessment of staff's attitude and level of exposure to computerisation, citing cases of passive resistance and refusal to use computers by some staff members. Stronge and Brodt (1985) also stress the importance of paying attention to employee attitudes, citing

reported failures of hospital computer implementations because of neglect in addressing negative attitudes of hospital staff.

Stronge and Brodt (1985) developed a tool to specifically measure nurses' attitudes toward computerisation and reported it to be a reliable and valid instrument. Brodt and Stronge (1986), Bongartz (1988) and Scarpa et al (1992) made use of the Stronge and Brodt (1985) tool to examine nurses' attitudes toward computerisation in the hospital setting. Scarpa et al. (1992) replicated the studies conducted by Brodt and Stronge (1986) and Bongartz (1988).

An unpublished study by Kosieradzki (1987) using Stronge and Brodt's questionnaire (1985), was carried out at the same hospital as this author's study. The sample consisted of 148 registered nurses who were randomly chosen. The statistical analysis comprised of non-parametric tests of frequency distributions, chi-square tests and cross-tabulations. By comparison, studies conducted by Brodt and Stronge (1986), Bongartz (1988) and Scarpa et al. (1992), also using Stronge and Brodt's questionnaire, used the parametric tests of ANOVA and unpaired *t*-tests. Each method is valid, although "nonparametric techniques are not as powerful as parametric techniques" in detecting differences (Burns and Grove, 1987, p. 476).

Brodt and Stronge (1986), Bongartz (1988) and Scarpa et al (1992) found the demographic variable of Age was not a significant factor in isolating the intensity of attitude between the age groups. Kosieradzki (1987) does not report any statistical analysis for age.

Brodt and Stronge (1986) report Years of Experience as being statistically significant, with nurses who have 20 years of experience having a more positive attitude to

computerisation than nurses with 10 or less years of experience. Bongartz (1988) and Scarpa et al. (1992) found no significant difference, and Kosieradzki (1987) did not test this variable for significance.

When considering Job Titles, Brodt and Stronge (1986) found that registered nurses had significantly more positive attitudes than licensed practical nurses whilst Scarpa et al. (1992) found head nurses to be more significantly positive than licensed practical nurses. Bongartz (1988) does not report an analysis of her study relating to Job Title. Kosieradzki (1987) found that there was no significant difference but reported an association between computerisation attitudes and Occupational Classification, with nurse administrators tending to be more positive than Registered Nurses.

Brodt and Stronge (1986), when testing for Highest Level of Education, reported that all levels of registered nurses had a significantly positive attitude to computerisation when compared to licensed practical nurses. Scarpa et al. (1992) reported no significant difference. Bongartz (1988) and Kosieradzki (1987) did not report any analysis related to Educational Level.

The type of Nursing Unit was analysed by Brodt and Stronge (1986) who found administration and paediatric units to be significantly more positive toward computerisation than medical and surgical units.

Brodt and Stronge (1986) examined the variable Shift Worked by the nurse and found no significant difference between shift and attitude to computerisation. Interestingly Shift Worked meant, full or part time employment, not day, night or evening shift. Bongartz (1988), Scarpa et al (1992) and Kosieradzki (1987) did not test this variable.

Scarpa et al. (1992) and Kosieradzki (1987) both examined Computer Experience or Computer Literacy of the nurse, and found nurses who have computer experience have a significantly more positive attitude to computerisation. Scarpa et al. (1992) simply determined whether the nurse had computer experience or no computer experience. Kosieradzki (1987) used a more sensitive scale and divided the nurses into groups ranging from low to high literacy. The high computer literacy group indicated the nurse had received formal training in computer application and programming. The low literacy group did not receive any formal training and used the computer for games, clerical duties or word processing. The validity of Kosieradzki's groupings in reference to computer literacy is questionable as he includes nurses with no literacy in the low literacy group, therefore gaining a skewed distribution when compared with Scarpa et al. (1992).

Further to computer experience, Scarpa et al. (1992) demonstrated at the $p < 0.001$ level of statistical significance that nurses with computer experience have a more positive attitude to computerisation, and Kosieradzki (1987) demonstrated at the $p < 0.002$ level of significance that nurses with high literacy skills have a more positive attitude to computerisation in comparison to the low literacy group. These findings are highly significant as it appears that nurses who are able to program computers have contributed greatly to this finding.

Further to the findings of Brodt and Stronge (1986), Bongartz (1988) and Scarpa et al. (1992), Kosieradzki (1987) identified information of concern to the people who plan computer training programs. This information concerned questions relating to expectations of the computer system and fears of the computer system. Kosieradzki

tested for nurses Fears versus Computer Literacy, Patient Care versus Computer Literacy, Nursing Efficiency versus Computer Literacy, Job Satisfaction versus Computer Literacy, Social Communication versus Computer Literacy, and Professional Communication versus Computer Literacy.

A study by Schwirian, Malone, Stone, Nunley and Francisco (1989) used Stronge and Brodt's (1985) questionnaire to compare nursing students to practicing staff nurses and found both groups to have a significant positive difference in attitude to computerisation when compared with use of computers at home and use of a word processor.

Burkes (1991) measured nurses' attitudes toward computer use and based her study on an adaptation of Vroom's expectancy theory. The Stronge and Brodt (1985) questionnaire was used and modified by Burkes for her study. Two questions were deleted and a third question was reworded. As this is the only study found to have used the modified tool, this researcher suggests that the modified tool requires further psychometric testing with a larger sample size.

No other studies using Stronge and Brodt's questionnaire have been reported in the literature.

Thomas (1988) developed two parallel forms of an instrument to measure attitudes toward computing in the nursing practice setting as well as in the nursing education setting. Again, this instrument is in need of further psychometric testing as there has been no other reported use of it in the literature.

No other study specifically measuring nurses' attitudes toward computerisation could be found in the literature.

In summary, the literature review describes reported studies which examine nurses' attitudes toward computerisation and shows the importance of identifying nurses attitudes to computerisation prior to implementation of an EIS.

CHAPTER 3

Theoretical Framework

A modern definition of attitude has been stated as a "relatively lasting cluster of feelings, beliefs, and behaviour tendencies directed toward specific persons, ideas, objects or groups" (Baron, 1986, p. 142). This definition implies that a person has positive, neutral or negative feelings toward an object, holds certain beliefs about it and tends to behave in specific ways toward it. For example a nurse may hold a neutral feeling toward a computer and have certain beliefs about it. This nurse may not feel inclined to learn how to access and use a computer. A nurse with a negative attitude toward a computer may also be reluctant to use a computer, but may also encourage colleagues not to use it.

An old but suitable definition of attitude, for the purpose of this study, is Allport's (1935) definition which states "an attitude is a mental and neural state of readiness, organised through experience, exerting a directive or dynamic influence upon the individuals response to all objects and situations with which it is related" (cited in Triandis, 1971, p. 2).

Baron (1986), and Allport (1935) cited in Triandis (1971, p. 2), both describe the components of attitudes as being affective, cognitive and behavioural. These three components are all measurable.

The conceptual framework illustrated in Figure 1 shows computers as being an attitude object, attitudes as being positive, neutral or negative and the components of attitudes as

being affective feelings, cognitive beliefs and potential behaviours. These components were measured in this study. Henerson, Morris and Fitz-Gibbon (1987, p. 13) state "When measuring attitudes, we must rely on inference, since it is impossible to measure attitudes directly". According to Fishbein and Ajzen (1975), cited in Stronge and Brodt (1985), the most common measure of attitude is by way of a questionnaire. Therefore in order to measure attitude in this study, statements of feelings, beliefs and potential behaviour were incorporated into the study questionnaire.

The literature review identified variables that may influence nurses' attitude to computerisation. The conceptual framework allows these variables to be categorised as stimuli which influence attitude toward computerisation as being positive, neutral or negative.

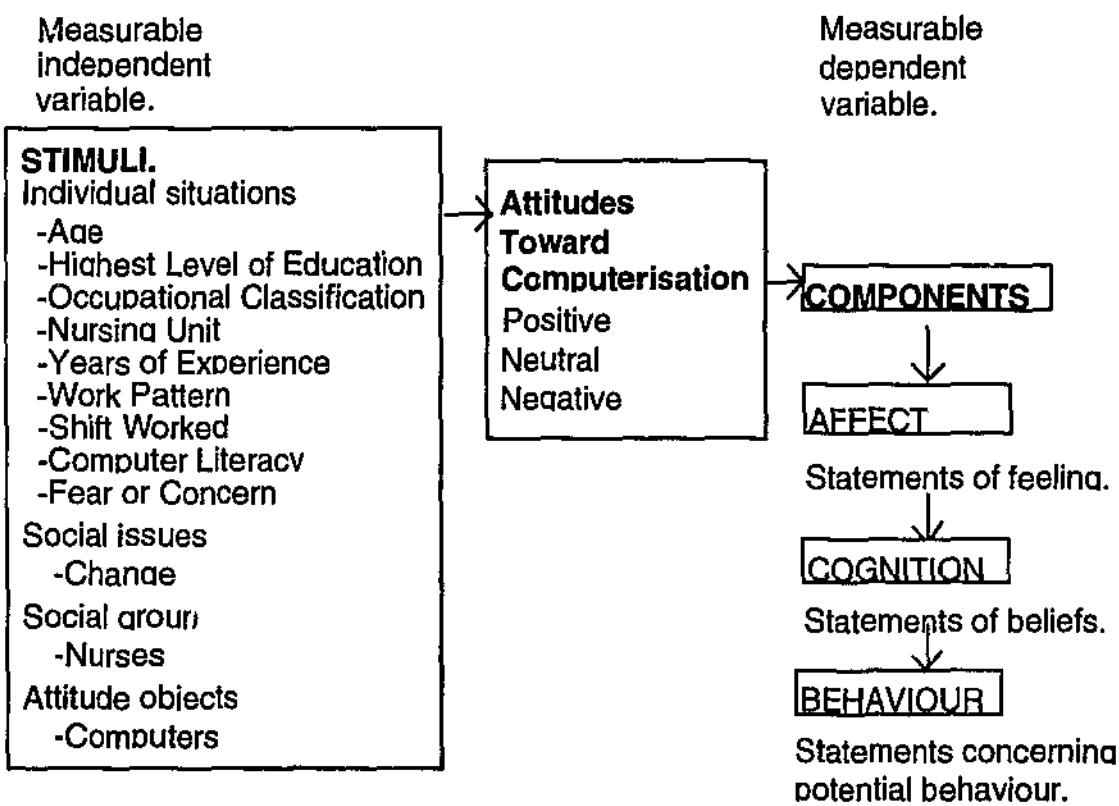

Figure1 : A conceptual framework of attitude adapted from Triandis (1971, p.3).

CHAPTER 4

Methodology

A descriptive study was undertaken to determine nurses' attitudes to computerisation, and which variables, if any, influence nurses attitudes to computerisation.

Design

A descriptive survey was conducted. This research design was chosen as this type of design would allow information about the characteristics of nurses' attitudes toward computerisation to be determined (Burns & Grove, 1987).

Sample and Setting

200 Registered and Clinical nurses working in all patient care areas at a Perth teaching hospital which employs 1 100 nurses (950 full time equivalents) were randomly selected, using a random numbers table, from the master nursing roster and invited to participate in the survey. Registered and Clinical nurses will be users of a new EIS to be introduced at that hospital and were therefore selected to participate.

Nurses excluded from the major survey were:

1. All nurses who do not perform direct patient care as these nurses will not use the system. Also, it was thought that these nurses could not have confidentiality assured.

2. Enrolled nurses because numbers of these nurses in patient care areas are small and again, confidentiality could not be assured.

3. Nurses employed on the same nursing unit as the researcher, as these nurses participated in the pilot study.

Variables

The dependent variable in the study is Attitude Toward Computerisation. The terms Attitude Toward Computerisation, attitude and attitude score are used synonymously throughout this thesis.

The independent variables studied were similar to those studied by Kosieradzki (1987) and Brodt and Stronge (1986), these being Age, Education, Occupational Classification, Nursing Unit, Years of Experience, Work Pattern, Shift Worked, expression of Fear or Concern, and Computer Literacy.

The variable Computer Literacy was examined by using subcategories to obtain a more sensitive assessment of where positive attitudes lie. The subcategories were Purpose of Use, Frequency of Use, Computer at Home, Training in the past.

The Purpose of Use was further categorised into Word Processing, Spread Sheet, Data Base Management, Games, Programming, Clerical Duties, on-line Library or Literature Search, Statistical Analysis, Electronic Communication.

Frequencies for the variables of Patient Care, Job Satisfaction, Relationship with Doctors, Para Medical Staff and Patients, were carried out. These variables were used by Kosieradzki to examine attitudes and permission was obtained to use these (M. Kosieradzki, personal communication, 30th November, 1993). See Appendix A for a copy of the letter sent to M. Kosieradzki seeking permission to use some of his material.

Instrument

The questionnaire used for the study is comprised of three sections. The first section contains demographic variables, the second focuses on computer literacy and use, as well as potential issues as identified by Kosieradzki (1987). The third section contains the questions from the Stronge and Brodt (1985) 20 item Likert scale questionnaire on attitudes toward computerisation. See Appendix B for a copy of the questionnaire sent to potential participants.

Permission was obtained from the copyright holder to use the questionnaire developed by Stronge and Brodt (1985) (J. H. Stronge, personal communication, 16th August, 1993). Appendix C contains the letter seeking permission to use the Stronge and Brodt tool.

It was decided to use the Stronge and Brodt tool for this study because it specifically examines nurses' attitudes to computerisation. Stronge and Brodt (1985) provide evidence of content validity based on a literature review.

A factor analysis of the Stronge and Brodt questionnaire was conducted by Scarpa et al. (1992), who found correlations of mean scores on the categories identified by Stronge and Brodt (1985) and factors obtained to be statistically significant, thus supporting content validity of the tool.

Reliability of the tool is supported by Stronge and Brodt (1985, p. 158). The authors checked for internal consistency using the Spearman-Brown prophesy formula which resulted in a "split-half reliability coefficient of $r = 0.90$" thus indicating an internally consistent and reliable questionnaire. Scarpa et al. (1992, p. 75) obtained a Cronbach's

alpha coefficient and reported an alpha of "0.92", also supporting reliability.

The same scoring system used by Stronge and Brodt (1985), Brodt and Stronge (1986), Bongartz (1988) and Scarpa et al (1992) has been used in the present study. Participants responses were scored as strongly agree = 5, agree = 4, uncertain = 3, disagree = 2 and strongly disagree = 1. Negatively worded items were reversed before scoring commenced. Consistent with the scoring system used by these researchers, scoring commences at 20 and increases in increments of 20 to a top score of 100. A score between 50 and 70 indicates a neutral attitude toward computerisation.

An open ended question was added to the questionnaire to allow respondents to express specific concerns they had in relation to using computers. See Appendix B, Section 2.

Procedure

A pilot study involving ten randomly selected registered nurses who work in the same patient care area as the researcher at the study hospital was conducted to identify potential difficulties with face validity, that is, were the questions understood and interpreted in the same way? No difficulties were identified. See Appendix D for the letter requesting participation in the pilot study.

Responses were included with the data obtained from the major survey, and the patient care area where these respondents worked was excluded from random selection of the sample population. The decision to include the pilot responses with the data from the major study was made because there were no problems found with face validity, and the number of participants involved in the pilot study would be similar to the number of participants randomly selected from each patient care area for the major survey. Also,

information obtained from the pilot participants was equally important for this study.

Potential participants selected for the pilot study received a study package that had been hand delivered to the patient care area nurses mail box. Each package was individually addressed, and contained a personalised letter of explanation of the purpose of the study and a request to participate, a consent form with instructions for its return, and a questionnaire with instructions for its completion and return. Additionally, there was a request for feedback on the questionnaire to be written on a blank sheet of paper included in the package for this purpose. Confidentiality was assured and supported by the request that no names be written on the questionnaire. Two clearly labelled, sealed receptacles were provided on the patient care area for separate return of the questionnaires and consent forms. A period of two weeks was allowed for completion of the questionnaire and return of the consent forms. See Appendix E for a copy of the consent form.

Potential participants in the main study were selected from the nursing master roster by use of a random numbers chart. A study package was delivered to the selected nurses at their own patient care area. Each package was individually addressed and contained a personalised letter of explanation of the purpose of the study, a request to participate, a consent form with instructions for its return and a questionnaire with instructions for its completion and return. Return of the signed consent form indicated agreement to participate in the study. Information pertaining to the exact nature of the computer modules to be introduced into the study hospital was not given as this was thought to potentially influence the responses to the questionnaire. Confidentiality was assured and supported by the request that no names be written on the questionnaire. See Appendix F for a copy of the request to participate letter.

One week after the questionnaires had been distributed, a reminder regarding return of the questionnaire was sent to all the participants. This was to ensure no undue delay in the return of the questionnaire. See Appendix G for a copy of the reminder letter. A communication of this sort reminded those nurses who had forgotten or delayed completion and return of the questionnaire to do so. Fourteen days were allowed for completion and return of the questionnaires and consent forms before data analysis began.

Data analysis

The data was analysed with the use of the Statistical Package for the Social Sciences (SPSS for Windows, version 6.0). Descriptive statistics were used to determine frequencies of the sample characteristics.

A Cronbach's alpha was calculated for the twenty item Stronge & Brodt attitude questionnaire. The mean attitude score and standard deviation was then calculated to identify overall attitude of the sample as being positive, negative or neutral.

Independent sample *t*-tests were conducted to identify significance at the $p \leq 0.05$ level, for differences in attitude when compared with the Work Pattern, Occupational Classification, Fear or Concern variables.

ANOVA was carried out to look for differences in attitude when compared with the Highest Level of Education, Nursing Unit, Shift Worked and Work Pattern variables at the $p \leq 0.05$ level of significance.

Correlation was carried out to look for differences in attitude when compared with the Age and Years of Experience variables at the $p \leq 0.05$ level of significance.

Computer literacy was examined as follows: Independent samples *t*-test were conducted to identify significance at the $p \leq 0.05$ level for differences in attitude when compared with the Computer Use, Computer at Home, Training and the nine purpose of use variables. The nine purpose of use variables were Word Processing, Spread Sheet, Data Base Management, Games, Programming, Clerical Duties, Library or Literature Search, Statistical Analysis, and Communication.

ANOVA was carried out to look for differences in attitude when compared with the Frequency of Use variables at the $p \leq 0.05$ level of significance.

Frequencies for the variables of Patient care, Job Satisfaction and Working Relationships was also conducted to identify perceived implications of the impact of the impending EIS.

CHAPTER 5

Results

The purpose of this study was to determine if nurses hold an overall positive, negative or neutral attitude toward computerisation and to identify variables which may significantly influence their attitudes toward computerisation.

This chapter will report on the characteristics of the study sample, the overall attitude score, and identify relationships between independent and the dependent variable. Responses to the questions concerning nursing care, job satisfaction and working relationships will also be reported.

Of the ten questionnaires sent to the nursing unit selected to pilot the questionnaire, eight responses were returned. This data was added to the data obtained from the major study.

Of the 200 questionnaires sent to the randomly selected nurses for participation in the study, 122 questionnaires were returned. The eight responses added from the pilot study provided a total of 130 returned questionnaires, and this gave an overall return rate of 61.9%. This return rate is above average for return rates using questionnaires, the reported return rate being 25-30% (Burns and Grove, 1987, p. 314). Only four returned questionnaires had one or more omitted answers or missing data.

Characteristics of the Study Sample

30.8% of the respondents were Clinical Nurses (Level Two) and 68.5% were Registered Nurses (Level One). The age range of the respondents was from 20-59 years of age, with the numbers of years of experience varying from zero to 38 years. 54.6% of the respondents worked full time and 45.4% were part time nurses.

Table 1 shows the frequency distribution of the respondents highest level of education obtained.

Table 1

Highest Level of Education

	Percent	Frequency
Hospital Diploma RN	82	63.1
Tertiary Diploma RN	15	11.5
Undergraduate Degree	24	18.5
Postgraduate Degree	1	0.8
Double Certificate	6	4.6
Missing data	2	1.5
Total	130	100.0

Table 2 illustrates the frequency distribution of the usual shifts worked by the participants.

Table 2

Shift Worked

	Frequency	Percent
Night Shift	13	10.0
Morning Shift	22	16.9
Evening Shift	5	3.8
Mixture of morning and evening	43	33.1
Full Rotation	47	36.2
Total	130	100.0

Table 3 illustrates the respondents purpose of use of a computer. It must be noted that some respondents were included in more than one group.

Table 3

Purpose of Use

	Percent	
Word Processing	50.8%	
Spread Sheet	9.2%	Also uses word processor
Data Base Management	7.7%	
Games	32.3%	
Programming	4.6%	Also uses word processor
Clerical Duties	14.6%	
Library or Literature Search	37.7%	
Statistical Analysis	3.1%	
Communication (electronic)	0.8%	

79.2% of respondents reported that they had used a computer before and 43.1% reported they owned or had access to a computer at home.

The frequency of use of computers for the total number of respondents is illustrated in table 4.

Table 4

Frequency of Use

	Frequency	Percent
Daily	10	7.7
Weekly	14	10.8
Monthly	13	10.0
More than monthly	66	50.8
Never	27	20.8
Total	130	100.0

Of the total number of respondents, 37.7% reported they had received formal computer training.

In response to the question, do you have any concerns or fears with computerised hospital systems, 68 participants said no and 60 participants said yes, that is 53.1% and 46.9% respectively.

Specific fears and concerns were identified by use of an open ended question. Responses were received from 65 participants, these responses are shown in table 5. It must be noted that some respondents provided more than one response.

Table 5

Fear or concern related to computerisation

Fear or Concern	Frequency
Increased time away from the patient	25
Receiving adequate training	18
Patient confidentiality	15
Lack of terminals	11
Downtime/breakdown/failure of the system	9
A need to be given the `Big Picture'	9
Data entry or erasure mistakes	8
Cost of the system	6
Increased workload	6
Depersonalisation of the patient	5

To confirm the internal consistency of the Stronge and Brodt (1985) tool and hence it's appropriateness for use in this study, a Cronbach's Alpha was calculated at 0.9142. This result will be explained in the discussion section.

Overall attitude score

The mean total attitude score, for the 20 item attitude rating tool was 64.46 with a standard deviation of 11.37. The minimum score was 28 and the maximum was 95. There were 126 valid cases. Discussion concerning the relevance of the overall attitude score as indicating a positive, negative or neutral score will follow in the next chapter.

Statistical analysis of the data

Student *t*-tests and ANOVA were conducted to compare the attitude means of some variables. It must be noted that the same variables had two or more subgroups which determined which specific test was used.

Specifically *t*-tests using a confidence interval of 95% were performed on the variables Work Pattern and Attitude Toward Computerisation, Occupational Classification and Attitude Toward Computerisation and Fear or Concern and Attitude Toward Computerisation. A probability level of 0.05 or less was classed as a significant result.

Results were:

1. No significant difference in attitude toward computerisation could be identified for the Work Pattern variable, as seen in table 6.

Table 6

t-test for Independent Samples of the Variable Work Pattern

Work Pattern	Number of Cases	Mean	SD
Part Time	57	64.0175	12.107
Full Time	69	64.8261	10.792

Mean difference = -0.8086

t-value	df	2-Tail Sig.
-0.40	124	0.693

2. No significant difference in attitude toward computerisation could be identified for the Occupational Classification variable, that is, between Registered Nurses (level one) and Clinical Nurses (level two) as seen in table 7.

Table 7

t-test for Independent Samples of the Variable Occupational Classification

Occupational Classification	Number of Cases	Mean	SD
Registered Nurse	86	63.4419	10.460
Clinical Nurse	39	66.3333	12.991

Mean difference = -2.8914

t-value	df	2-Tail Sig.
-1.33	123	0.188

3. A significant difference in attitude toward computerisation was identified for the "Fear" variable, that is, the nurses reported they were fearful or had a concern about computerisation as shown in table 8.

Table 8

t-test for Independent Samples of the Variable Concerns or Fears

Concern or Fear	Number of Cases	Mean	SD
No	67	69.4776	9.978
Yes	58	58.8276	10.227

Mean difference = 10.6500

t-value	df	2-Tail Sig.
5.88	123	0.000

ANOVA was performed on Highest Level of Education and Attitude Toward Computerisation, Shift Worked and Attitude Toward Computerisation, and Nursing Unit and Attitude Toward Computerisation.

Results were:

1. No significant difference was identified in attitude toward computerisation for the Highest Level of Education variable as shown in table 9.

Table 9

Analysis of Variance of Highest Level of Nursing Education by Attitude Toward Computerisation

Source	df	F Prob.
Between Groups	4	0.1014
Within Groups	119	
Total	123	

2. No significant difference was identified in attitude toward computerisation for the Nursing Unit variable. Table 10 presents the analysis of variance and Figure 2 shows the distribution of nurses by groups of nursing units and provides mean attitude scores for these groups.

Table 10

Analysis of Variance of Nursing Unit by Attitude Toward Computerisation

Source	df	F Prob.
Between Groups	11	0.0994
Within Groups	113	
Total	124	

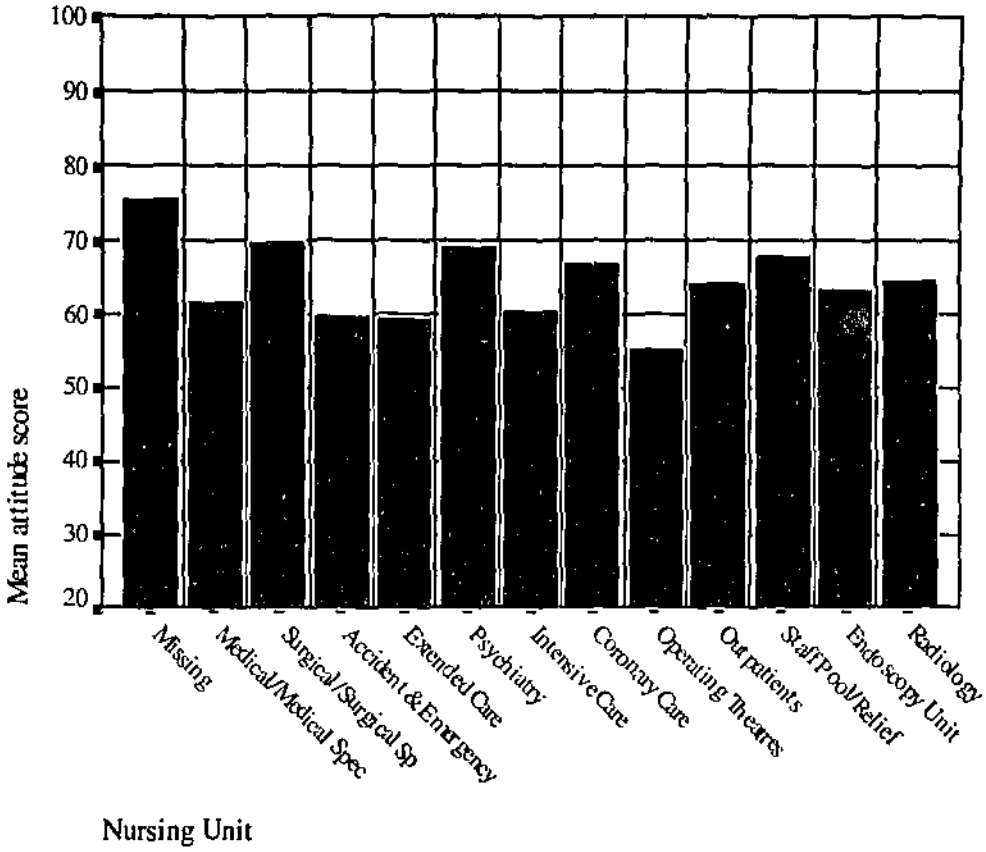

Figure 2. Mean attitude score by Nursing Unit.

3. No significant difference in attitude toward computerisation was found for the Shift Worked variable. Table 11 presents these results.

Table 11

Analysis of Variance of Shift Worked by Attitude Toward Computerisation

Source	df	F Prob.
Between Groups	4	0.2388
Within Groups	121	
Total	125	

A Pearson's Correlation Coefficient was conducted on the Age and Years of Experience variables to determine if these variables influenced attitude toward computerisation.

Results were:

1. No significant correlation between Age and attitude toward computerisation was found. See table 12.

Table 12

Correlation of Age by Attitude Toward Computerisation

α	Valid cases	P
-0.0448	124	0.622

2. No significant correlation between Years of Experience and attitude toward computerisation. Table 13 shows these results.

Table 13

Years of Experience by Attitude Toward Computerisation

α	Valid cases	P
-0.0310	126	0.730

For the variable Computer Literacy, there were five subcategories: Computer Use, Purpose of Use, Computer at Home, Frequency of Use and Training.

The Purpose of Use variable was broken down into nine further subcategories of Word Processing, Spread Sheet, Data Base Management, Games, Programming, Clerical Duties, Library or Literature Search, Statistical Analysis and Communication.

It was assumed that those nurses without any computer experience had not had any computer training and did not have a computer at home.

Student *t*-tests were performed for previous Computer Use and Attitude Toward Computerisation, Computer at Home and Attitude Toward Computerisation, and previous Training and Attitude Toward Computerisation.

Results are:

1. No significant difference in attitude toward computerisation between those that have used a computer and those that have not used a computer as shown in table 14.

Table 14

t-tests for Independent Samples of the Variable Used Computer

Computer Use	Number of Cases	Mean	SD
No	24	60.5833	13.632
Yes	102	65.3725	10.638

Mean Difference = -4.7892

t-value	df	2-Tail Sig.
-1.88	124	0.063

2. There is a significant difference in attitude toward computerisation between those nurses that have a computer at home and those nurses that don't have a computer at home, as shown in table 15.

Table 15

t-tests for Independent Samples of the Variable Computer at Home

Computer at Home	Number of Cases	Mean	SD
No	70	62.4857	11.670
Yes	56	66.9286	10.564

Mean difference = -4.4429

t-value	df	2-Tail Sig.
-2.21	124	0.029

3. No significant difference in attitude toward computerisation between those nurses that have received some formal computer training in the past and those nurses that have not received formal training. See table 16.

Table16

t-tests for Independent Samples of the Variable Training

Training	Number of Cases	Mean	SD
No	77	63.0390	11.394
Yes	49	66.6939	11.070

Mean Difference = -3.6549

t-value	df	2-Tail Sig.
-1.77	124	0.078

A *t*-test was also performed for each of the subcategories of Purpose of Use variable and Attitude Toward Computerisation. The subcategories were: Word Processing, Spread Sheet, Data Base Management, Games, Programming, Library or Literature Search,

Statistical Analysis and Communication.

Results were:

1. A significant difference in attitude toward computerisation was found between those nurses that have used a word processor and those nurses that have not used a word processor. See table 17.

Table 17

t-test for Independent Samples of the Variable Word Processing

Word Processing	Number of Cases	Mean	SD
No	60	61.9167	10.967
Yes	66	66.7727	11.308

Mean Difference = -4.8561

t-value	df	2-Tail Sig.
-2.44	124	0.016

2. A significant difference in attitude toward computerisation was found between those nurses that have used a spread sheet application and those that have not. See table 18.

Table 18

t-tests for Independent Samples of the Variable Spread Sheet

Spread Sheet	Number of Cases	Mean	SD
No	114	63.7807	10.873
Yes	12	70.9167	14.260

Mean Difference = -7.1360

t-value	df	2-Tail Sig.
-2.10	124	0.038

3. No significant difference in attitude toward computerisation by nurses who had used data base applications and those that had not. See table 19.

Table 19

t-tests for Independent Samples of the Variable Data Base Management

Data Base Management	Number of Cases	Mean	SD
No	116	64.3190	11.206
Yes	10	66.1000	13.658

Mean Difference = -1.7810

t-value	df	2-Tail Sig.
-0.47	124	0.636

4. No significant difference in attitude toward computerisation was found for those nurses that had played computer games and those that had not. See table 20.

Table 20

t-tests for Independent Samples of the Variable Games

Games	Number of Cases	Mean	SD
No	85	63.5647	12.160
Yes	41	66.3171	9.379

Mean Difference = -2.7524

t-value	df	2-Tail Sig.
-1.28	124	0.204

5. There was a significant difference in attitude toward computerisation in those nurses that had programming skills and those nurses that did not. See table 21.

Table 21

t-tests for Independent Samples of the Variable Programming

Programming	Number of Cases	Mean	SD
No	120	64.0167	11.178
Yes	6	73.3333	12.517

Mean Difference = -9.3167

t-value	df	2-Tail Sig.
-1.98	124	0.050

6. No significant difference in attitude toward computerisation of those nurses who perform computer clerical duties and those nurses who don't. See table 22.

Table 22

t-tests for Independent Samples of the Variable Clerical Duties

Clerical Duties	Number of Cases	Mean	SD
No	107	64.4486	11.345
Yes	19	64.5263	11.801

Mean Difference = -0.0777

t-value	df	2-Tail Sig.
-0.03	124	0.978

7. No significant difference in attitude toward computerisation of those nurses who have performed on-line library or literature searches and those nurses who don't. See table 23.

Table 23

t-tests for Independent Samples of the Variable Library or Literature Search

Library or literature search	Number of Cases	Mean	SD
No	78	64.0256	11.802
Yes	48	65.1667	10.704

Mean Difference = -1.1410

t-value	df	2-Tail Sig.
-0.55	124	0.586

8. No significant difference in attitude toward computerisation was found for those nurses that had used a computer for statistical analysis and those that had not. See table 24.

Table 24

t-tests for Independent Samples of the Variable Statistics

Statistics	Number of Cases	Mean	SD
No	122	64.4426	11.517
Yes	4	65.0000	5.715

Mean difference = -0.5574

t-value	df	2-Tail Sig.
-0.10	124	0.924

9. No significant difference in attitude toward computerisation for those nurses that have used a computer for electronic communication and those nurses that have not. Refer to table 25.

Table 25

t-tests for Independent Samples of the Variable Communication

Communication	Number of Cases	Mean	SD
No	125	64.4480	11.411
Yes	1	66.0000	.

Mean Difference = -1.5520

t-value	df	2-Tail Sig.
-0.14	124	0.892

Table 26 presents the result obtained from the analysis of variance carried out to look for a significant difference in the mean attitude score of the respondents when examining the Frequency of Use variable. It can be seen that there was no significant difference found.

Table 26

Analysis of Variance of Attitude Toward Computerisation by Frequency of Use.

Source	df	F Prob.
Between Groups	3	0.2144
Within Groups	98	
Total	101	

Also reported are the frequency distributions for the variables Nursing Care, Job Satisfaction and Working Relationship with Doctors, Paramedical Staff and Patients.

The frequency distribution for the perceived influence of computerisation on the variable Nursing Care is presented in table 27.

Table 27

Influence on Nursing Care

	Frequency	Percent
Greatly improve	9	7.3
Improve	66	53.2
No effect	37	29.8
Deteriorate	11	8.9
Greatly deteriorate	1	0.8
Missing	6	
Total	130	100.0

Note. The percentages are calculated without the use of the missing data and then rounded to the nearest 0.1 percent.

Table 28 presents the frequency distribution for the perceived influence of computerisation on the variable Job Satisfaction.

Table 28

Influence on Job Satisfaction

	Frequency	Percent
More satisfying	29	22.5
No change in satisfaction	62	48.1
Less satisfying	8	6.2
Uncertain	30	23.3
Missing	1	
Total	130	100.0

Note. The percentages are calculated without the use of the missing data and then rounded to the nearest 0.1 percent.

Table 29 presents the frequency distribution for the perceived influence of computerisation on the variable Working Relationship with Doctors.

Table 29

Influence on Working Relationship with Doctors

	Frequency	Percent
Improve the relationship	21	16.3
No effect	66	51.2
Deteriorate the relationship	7	5.4
Uncertain	35	27.1
Missing	1	
Total	130	100.0

Note. The percentages are calculated without the use of the missing data and then rounded to the nearest 0.1 per cent.

The frequency distribution of the perceived influence of computerisation on the variable Working Relationship with Para-medical Staff is presented in table 30.

Table 30

Influence on Working Relationship with Paramedical Staff

	Frequency	Percent
Improve the relationship	28	21.7
No effect	58	45.0
Deteriorate the relationship	6	4.7
Uncertain	37	28.7
Missing	1	
Total	130	100.0

Note. The percentages are calculated without the use of the missing data and then rounded to the nearest 0.1 per cent.

Finally the frequency distribution of the perceived influence of computerisation on the variable Working Relationship with Patients is presented in table 31.

Table 31

Influence on Working Relationship with Patients

	Frequency	Percent
Improve	34	26.2
No effect	52	40.0
Deteriorate relationship	15	11.5
Uncertain	29	22.3
Total	130	100.0

Note. Percentages rounded to the nearest 0.1 per cent.

CHAPTER 6

Discussion

Discussion of the results obtained from this study will follow in the order of the research questions asked. However, initially, the result of the Cronbach alpha calculated to confirm the appropriateness of the Stronge and Brodt (1985) tool for the study, must be noted. According to Burns and Grove (1993, p. 342) a Cronbach alpha of 1.0 indicates that all questions in a specific tool are measuring the same construct. An alpha of 0.8 - 0.9 indicates that an instrument reflects more richly the fine discriminations in levels of the construct. Therefore it was found that the Cronbach alpha obtained in this study indicates that the Stronge and Brodt tool (1985) was an appropriate tool to use, and it follows that all results obtained are relevant.

In relation to the first study question, what are the attitudes of nurses at a Perth teaching hospital toward computerisation, a mean attitude score was calculated. This score was less than the attitude scores reported from other similar studies by Brodt and Stronge (1986), Bongartz (1988) and Scarpa et al (1992). Brodt and Stronge (1986) reported an attitude score of 70.8, and Scarpa et al (1992) reported an attitude score of 71.4. Bongartz (1988) reported two scores as her study involved two separate study settings. Participants at one setting used computers in their day to day tasks and the participants at the other setting did not. Bongartz reported scores of 70.1 and 72.2 respectively. A score between 70 and 80 indicates a positive attitude toward computerisation, and a score between 80 to 100 indicates a strongly positive attitude toward computerisation. Therefore the score obtained from these previous studies indicate a positive attitude toward computerisation. On the other hand, this study found that the participants hold

an overall neutral attitude toward computerisation with a score of 64.46.

The study by Kosieradzki (1987) did not report a mean attitude score that would allow a direct comparison to be made, he does however report on a grading system that would allow a comparison of attitude by use of frequency distribution. He found, that 6% of his total sample were not in favour of computerisation, whereas the present study found that 19.8% of participants were not in favour of computerisation. Reasons for the notable increase in the percentage of nurses not in favour of computerisation could be attributed to the concerns or fears identified by this study's open ended question. These concerns or fears include, reduced available time to provide direct patient care, inadequate training, breach of confidentiality, lack of computer terminals, system failure, data erasure or entry error, fear of the unknown, increased workload, and cost of the system in the present post recession economic climate.

36.5% of Kosieradzki's (1987) sample of nurses were reported to have a neutral attitude toward computerisation, whilst the present study found 25.4% of nurses had neutral attitudes. The reduction in the percentage of nurses reported to have neutral attitudes in the present study can be attributed to the increase in the percentage of nurses found to be not in favour of computerisation. It is interesting to note that both Kosieradzki (1987) and the present study reported similar percentages of nurses who hold a favourable attitude toward computerisation. The percentages are 57.4% and 54.8% respectively.

It is also suggested that the difference in overall attitude score between the present study and the previously identified studies by Bongartz (1988), Scarpa et al (1992) and Brodt and Stronge (1986), and the distribution frequencies between the present study and Kosieradzki's (1987) could be due to differences in occupational classification. Bongartz

(1988) study sample involved Licensed Practical Nurses as well as Registered Nurses, and thus provided a wider range of occupational classifications than the present study. Scarpa et al (1992) also sampled a wider range of nurses than the present study and reported that Registered Nurses had significantly more positive attitudes toward computerisation than Licensed Practical Nurses. Similarly Brodt and Stronge (1986) sampled a wider range of nurses and reported that Head Nurses had significantly more positive attitudes toward computerisation than Registered Nurses. Kosieradzki (1987) sampled Nurse Administrators and Registered Nurses and reported no significant difference in attitude toward computerisation between occupational classifications. It can be concluded that the wider range of occupational classifications may explain the differences in the overall attitude score between the other reported studies and the present study. This finding is inconclusive, and indicates that further investigation is required in order to explain the difference in the mean attitude score.

In respect to the second study question relating to the identification of variables that could influence attitudes toward computerisation, there was no significant difference found in attitude toward computerisation for the variables of Work Pattern, Occupational Classification, Highest Level of Education, Nursing Unit, Shift worked, Age, or Years of Experience. Also for the Computer Literacy subgroup variables of Computer Use, Training and Frequency of Use, there was no significant difference found in attitude toward computerisation. For the Purpose of Use subgroup variables of Data Base Management, Games, Clerical Duties, Library or Literature Search, Statistical Analysis and Communication, there was no significant difference found in attitude toward computerisation.

However a significant difference in attitude was found for the variable of Fear. Also a significant difference in attitude toward computerisation was found for the Computer Literacy subgroup variable of Computer at Home. Additionally, the Purpose of Use subgroup variables of Word Processing, Spread Sheet, and Programming were found to have a significant difference in attitude toward computerisation.

Participants who reported that they had a fear or concern about computerisation were found to be significantly more likely to have a negative attitude toward computerisation. No other reported studies have tested for the variable Fear against Attitude Toward Computerisation. Therefore it is suggested that if a person is fearful of or concerned with the introduction of technological change, their attitude toward the change could be negative or in some cases neutral. The present study identified the overall attitude as being neutral.

For the significant difference in attitude toward computerisation found in the variables of Word Processing, Spread Sheet and Programming, it is suggested that skills in these applications can be readily transferable to use of an EIS. No other studies have reported on the relationship of these variables and attitude toward computerisation.

Similarly, no other studies have reported on the variable Computer at Home and attitude toward computerisation. The present study found a significant difference for this variable and attitude toward computerisation. The question asks "Do you own or have access to a computer at home?" Although this question is present on Kosieradzki's questionnaire (1987) and has been used in a previous study, it should have been worded more specifically for the present study. For example, respondents may have indicated that they own a computer depending on the family's concept of ownership. Also the

respondents may have access to the computer at home, but in reality do not make use of it. Despite possible differences in interpretation of the question, it is suggested by the results that the participants with computers at home have a positive attitude toward computerisation and will be accepting of the new EIS.

For the third study question relating to how nurses expect computerisation to effect Nursing Care, Job Satisfaction, Working Relationships with Doctors, Paramedical Staff and Patients, it is reported that over 50% of participants expect nursing care to be improved, and close to 30% expect there will be no effect on nursing care. 9.7% expect some form of deterioration in nursing care as a result of computerisation. It is encouraging to see only a small percentage of nurses expect computerisation to adversely effect nursing care.

48.1% of the participants expect job satisfaction to remain the same, 22.5% expect job satisfaction to improve and 23.3% are undecided. 6.2% expect job satisfaction to decrease. Again it is encouraging to see only a small percentage of nurses expecting job satisfaction to deteriorate, and the majority believe that job satisfaction will remain the same or improve.

51.2% of the participants expect no change in the working relationship with doctors and 45% expect no change in working relationship with para-medical staff. 40% expect the working relationship with patients to be unchanged, whilst 26.2% expect the relationship to be improved. It can be seen that the majority of nurses believe that the working relationships will remain unchanged. A small percentage believe the relationship with doctors and para-medical staff will deteriorate, that is 5.4% and 4.7%. It is of concern that 11.5% of the participants believe the working relationship with

patients will be affected.

In addition to the research questions, it should be noted that the present study found that Age, Years of Experience, Highest Level of Education, Nursing Unit, Shift Worked, Computer Use were not significant in affecting attitude towards computerisation.

The studies of Brodt and Stronge (1986), Bongartz (1988) and Scarpa et al (1992) all agree with the present study, that age has no relationship with attitude towards computerisation. It would be reasonable to not assess participants age in any future studies.

The studies of Bongartz (1988) and Scarpa et al (1992) agree with the present study in finding that years of nursing experience has no relationship with attitude toward computerisation, whereas Brodt and Stronge (1986) reported a significant relationship for years of nursing experience and attitude towards computerisation. This discrepancy needs further investigation.

Scarpa (1992) agrees with the present study that there is no significant difference in attitude towards computerisation when looking at nurses level of education, and the Brodt and Stronge (1986) study differs.

Only the Brodt and Stronge (1986) study looked at shift worked and agrees with the present study in finding no significant difference in attitude toward computerisation. In this case Brodt and Stronge understood shift worked to mean the classification of nurses into groups of full time and part time workers.

The present study found that nurses with computer experience had no significant difference in attitude toward computerisation when compared with nurses that had no experience, whereas Scarpa et al (1992) found a significant difference. Kosieradzki found nurses with high computer literacy to have a significantly more positive attitude toward computerisation. The present study found that nurses with word processing, spread sheet application and programming skills to have significantly positive attitudes towards computerisation. Finally it can be seen that 50.8% of the participants have word processing skills, 9.2% have spread sheet skills and a small 4.6% have programming skills. Those with spread sheet skills and programming skills also use a word processing package. Close to 80% of respondents reported that they had used a computer before. It is suggested that nurses are more computer aware and that this aspect can explain the differences in the findings. The level or type of competence in the use of computer applications could also explain the mixed findings.

CHAPTER 7

Conclusions, Implications, Recommendations and Limitations.

This chapter discusses the conclusions that have been drawn from the study, the implications for nursing, and makes recommendations for nursing practice, management, education and future research. The study limitations are then noted.

Conclusions

130 nurses responded to a questionnaire designed to determine their attitude toward computerisation, identify variables which influence attitude to computerisation, if any, and elicit how nurses expect computerisation to affect nursing care, job satisfaction, and working relationships.

The conceptual framework adopted from Triandis (1971) to guide this study identifies potential stimuli influencing attitude to computerisation as age, years of experience, highest level of education, occupational classification, nursing unit, work pattern, shift worked, computer literacy and fear or concern. These were the variables examined by this study as potentially influencing attitude toward computerisation. As well, the conceptual framework identifies attitude to computerisation as being positive, negative or neutral, and in order to identify the attitude toward computerisation of the participants, the questionnaire contained statements of feelings, beliefs and potential behaviours which the participants were requested to score. The study found that the participants hold an overall neutral attitude toward computerisation.

This attitude is different to studies by Brodt and Stronge (1986), Bongartz (1988) and Scarpa et al (1992) who reported that their participants hold a positive attitude toward

computerisation. This study suggests that potentially an increase of computer awareness has resulted in a decrease in mean attitude toward computerisation, although the study found that just under half of the participants have no computer skills.

The present study identified variables of Fear or Concern, Word Processing, Spread Sheet and Programming that significantly influenced attitude toward computerisation. These variables had not been reported in previous studies.

This study also reports that participants with word processing, spread sheet and programming skills have a significantly positive attitude toward computerisation and that it is suggested that these individuals will not have major difficulty with accepting and using an EIS in the work setting.

In addition the present study found that participants expect computerisation to improve nursing care and not to change job satisfaction or working relationships. These findings have not been reported by previous studies.

Implications

The study findings have implications for nursing, particularly in the area of staff development or computer training. For nurses who have fears or concerns, this will hinder in the education process. The study findings and the literature suggest that there will be certain failure with use of the EIS if training is inadequate or not satisfactory. Trainers need to be fully informed of nurses potential fears, anxieties and concerns. Potential users should be involved as much as possible before implementation of any EIS.

Recommendations

This researcher suggests the following:

1. Fears or concerns of users should be recognised by implementation personnel and trainers, and appropriate strategies be used to ensure that an EIS will be accepted by the users. Trainers should be skilled in the application of adult teaching principles and change theory strategies.

2. Information sharing needs to begin well before any EIS is implemented. For example, newsletters could be designed to not only provide information but to help allay anxieties.

3. Key players who are known to be resistant to change should be selected to be involved in the project as early as possible. This strategy should provide a feeling of ownership and help overcome resistance.

4. Trainers should not over estimate the computer sophistication of potential users. The trainers should identify those nurses with relevant skills and involve them in early education so they can be a unit based resource.

5. Opportunity is provided for nurse users to practice newly acquired computer skills at work without fear that colleagues are observing. This can be achieved by setting up games on the computer that nurses can play, thus helping with the dexterity of using a mouse and allowing the nurse to become comfortable with using a new technology. Nurses should feel free to go back to the training room and practice as much as possible.

6. Manuals need to be available and be user friendly. A manual that is difficult to read because of jargon, or makes the location of specific items of information difficult, will discourage use.

Recommendations for further research

this researcher recommends that should this study be replicated:

1. Additional variables dealing with socialisation toward the use of computers and responses to previous education processes be included

2. A wider range of occupational classifications be included if possible.

3. The variable of Age to be omitted as it has not shown any relationship with attitude toward computerisation.

4. The variables of Word Processing, Spread Sheet Application, Programming, Computer at Home, Fear or Concern, be included in future studies.

Limitations

The present study findings are limiting because:

1. The attitude score can not be generalised to nurses at any other hospital other than the study hospital. Nurses at other hospitals may use computers when performing day to day tasks, and therefore hold a different attitude toward computerisation than the study participants who do not use computers as part of their work activities.

2. The study hospital requested that participants be confined to only Registered Nurses and Clinical Nurses. If nurses from other occupational classifications had participated in the study, the resultant overall attitude score may have differed.

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Letter seeking permission to use questions.

[redacted]

Mr M. Kosieradzki
[redacted]

Dear Michael,

I am writing to obtain permission from you to use sections of the questionnaire which you designed when investigating Nurse's Attitude to Computerisation for your Graduate Diploma in Organizational Psychology.

I am studying for a Bachelor of Nursing Degree with Honours at Edith Cowan University, Churchlands Campus. My research project will be based on similar lines as your project.

My study will be undertaken at a Perth teaching hospital, the sample size being 300 RN and EN staff.

I can be contacted at the above address or phone number if you wish to discuss any aspects of my research.

Thanking you in anticipation,

Yours sincerely,

John R. Crofts RN.

Attitude toward Computerisation

Researcher: John Crofts

It should not take longer than twenty minutes to complete the questionnaire.
Please read each statement carefully then select the appropriate responses.
Give your first reaction and response to the statement.
Do not omit any item.

Section 1.

1. _____yrs — Age.

2. _____yrs — How long have you been a nurse?

3. _____ Highest level of nursing education obtained.
- **a.** Registered Nurse-Hospital Diploma.
- **b.** Registered Nurse-Tertiary Diploma.
- **c.** Undergraduate Degree.
- **d.** Postgraduate Degree.
- **e.** Other. Specify.....

4. _____ Current occupational classification.
- **a.** Registered Nurse, Level 1.
- **b.** Clinical Nurse, Level 2.

5. _____ Usual nursing unit.
- **a.** Medical / Medical speciality.
- **b.** Surgical / Surgical speciality.
- **c.** Accident & Emergency.
- **d.** Extended Care.
- **e.** Psychiatry.
- **f.** Intensive care.
- **g.** Coronary care.
- **h.** Operating theatres.
- **i.** Other. Specify.....

6. _____ What is your current work pattern?
- **a.** Full time.
- **b.** Part time. (Less than 70hrs / fortnight)

7. _____ What is the usual shift that you work?
- **a.** Night shift.
- **b.** Morning shift.
- **c.** Evening shift.
- **d.** Mixture of morning and evening shift.
- **e.** Full rotation.

Section 2.

8a. _____Have you ever used a computer?

a. Yes. Go to question 8b.
b. No. Go to question 9.

The following question can have multiple answers.

8b. _____For what purpose?

a. Word processing.
b. Spreadsheet application.
c. Database management.
d. Games.
e. Programming.
f. Clerical duties.
g. On line library or literature search
h. Other (specify).....

8c. _____ Do you own or have access to a computer at home?

a. Yes.
b. No.

8d. _____ How often do you use a computer?

a. Daily.
b. Weekly.
c. Monthly.
d. Less than once a month.

8e. _____ Have you ever attended any formal computer training?

a. Yes.
b. No.

9. _____ To what extent do you think computers will influence nursing care?

a. Greatly improve.
b. Improve.
c. No effect.
d. Deteriorate.
e. Greatly deteriorate.

10. _____ As a consequence of computerisation, do you think your job will be...

a. More satisfying.
b. No change in satisfaction.
c. Less satisfying.
d. Uncertain.

11. _____ To what extent will computerisation influence your working relationship with doctors?

a. Improve the relationship.
b. No effect.
c. Deteriorate the relationship.
d. Uncertain.

12. _____ To what extent will computerisation influence your working relationship with the para-medical staff? (e.g. Physiotherapist, Occupational therapist, Social worker)

a. Improve.
b. No effect.
c. Deteriorate the relationship.
d. Uncertain.

13. _____ To what extent will computerisation effect your working relationship with your patients?

a. Improve.
b. No effect.
c. Deteriorate the relationship.
d. Uncertain.

14a. _____ Do you have any concerns or fears with computerised hospital systems?

a. Yes.
b. No.

14b. If you have any concerns or fears please comment in this space

_____

_____

_____

_____

PTO to section 3.

Section 3.

Please circle your response.

SA = Strongly agree, A = Agree, U = Uncertain, D = Disagree, SD = Strongly disagree.

15. A computer increases costs by increasing the nurses workload.	SA	A	U	D	SD
16. Computers cause a decrease in communication between hospital departments.	SA	A	U	D	SD
17. Computers will allow the nurse more time for the professional tasks for which she/he is trained.	SA	A	U	D	SD
18. Part of the increase in costs of health care is because of computers.	SA	A	U	D	SD
19. The time spent using a computer is out of proportion to the benefits.	SA	A	U	D	SD
20. Computers represent a violation of patient privacy.	SA	A	U	D	SD
21. Only one person at a time can use a computer terminal and therefore, staff efficiency is inhibited.	SA	A	U	D	SD
22. Computerisation of nursing data offers nurses a remarkable opportunity to improve patient care.	SA	A	U	D	SD
23. Computers contain too much personal data to be used in an area as open as a nursing station.	SA	A	U	D	SD
24. Computers cause nurses to give less time to quality patient care.	SA	A	U	D	SD
25. If I had my way, nurses would not ever have to use computers.	SA	A	U	D	SD
26. Computers should only be used in the financial department.	SA	A	U	D	SD
27. Computers make nurses' jobs easier.	SA	A	U	D	SD
28. Paperwork for nurses has been greatly reduced by the use of computers.	SA	A	U	D	SD

29. Orientation for new employees takes longer because of computers and, therefore, unnecessary work delays occur.	SA	A	U	D	SD
30. Nursing data does not lend itself to computers	SA	A	U	D	SD
31. Computers save steps and allow the nursing staff to become more efficient.	SA	A	U	D	SD
32. The more computers in an institution, the less number of jobs for employees.	SA	A	U	D	SD
33. Increased computer usage will allow nurse more time to give patient care.	SA	A	U	D	SD
34. Because of computers, nurses will face more lawsuits.	SA	A	U	D	SD

If you wish to make any comments, please write in the space provided.

Please check to see that you have answered all the questions you are required to answer.

THANK YOU FOR YOUR PARTICIPATION

Letter seeking permission to use questionnaire.

Dr James Stronge Ph.D.
Assistant Professor
College of Education and Health Sciences,
Bradley University
Peoria. Illinois.

Dear Doctor Stronge,

I am writing to obtain permission from you to use the prepared questionnaire on "Nurses Attitudes Toward Computerization" (1985).

I am currently studying for a Bachelor of Nursing with Honours at the Edith Cowan University, Churchlands Campus, Western Australia.

My research will involve a sample of 300 Registered and Enrolled Nursing staff at a Perth teaching hospital shortly to be the pilot hospital for a large scale electronic information system implementation.

I am happy to discuss my project with you in more detail if you so desire.

Yours sincerely,

John R. Crofts RN.

Pilot letter

Dear <name>,

I am conducting a survey on Nurses' attitude towards computers and I would like you to test the questionnaire that I will be using.

Please complete the consent form and place it in the box provided in your ward area.

Please then complete the questionnaire and place it in the box labelled to recieve the questionnaire together with your comments. Please do not put your name on the questionnaire as there is no need to know who the questionnaires are from.

Please time yourself when completing the questionnaire and write down how long it took you to complete.

If you have any suggestions or comments on the questionnaire layout or any difficulty with understanding what is asked or interpreting the questions, please write of these on the blank sheet of paper provided.

If the questionnaire has no flaws, the data gathered will be included in the main study.

Please return by Sunday, 03/04/1994.

Yours sincerely,

John R. Crofts.

Consent to Participate in Attitude Toward Computerisation Study.

This study is being conducted by John Crofts, a Bachelor of Nursing with Honours student at Edith Cowan University. John can be contacted at home on [redacted]

I _____
Family name Given name

of _____.
Ward/ Department

have read and understand the invitation to participate in the Attitude to Computers study. I understand that participation involves completing a questionnaire.

I know that my participation in this study is strictly voluntary and that I have the right to withdraw at any stage.

I am aware that the researcher will not be able to identify me, and that the information obtained from this study will be used in a research report.

_____ _____
Signature Print

Letter Requesting Participation in Main Study

To: <Area of work>

Dear <Name>,

You are invited to participate in a study of nurses' attitude toward computerisation.

The purpose of the study is to examine nurses attitudes towards computers in the pilot hospital prior to implementation of the electronic information system with terminals in each patient area.

Data obtained from the questionnaire will be analysed and a report compiled. This report will be seen by others. However, you are requested not to put your name on the questionnaire, so you cannot be identified. The completed questionnaires will be securely locked in a filing cabinet at the researcher's home for five years. They will then be destroyed.

Any enquiries regarding the study can be directed to either myself on [redacted] or my supervisor Maxine Serrell, at the School of Nursing, Edith Cowan University, Churchlands campus, on [redacted]

Please return the completed consent form in the box provided in your ward area.

The questionnaire is to be posted separately in the box labelled to collect the questionnaires, in your ward area by Monday 18/04/94.

Yours sincerely,

John R. Crofts.
04/04/94

Reminder Letter

Dear <Name>,

Just a quick note to remind you to place your completed questionnaire in the box provided on or near your work area by Monday, 18/04/94

If you have any queries don't hesitate to contact me on [redacted] or my supervisor Maxine Serrell on [redacted]

Thank you for your participation.

Yours sincerely,

John R. Crofts.